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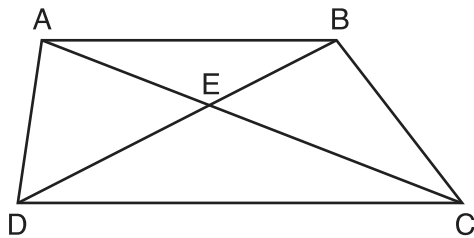
4 In parallelogram $ABCD$, diagonals \overline{AC} and \overline{BD} intersect at E .
Which statement proves $ABCD$ is a rectangle?

- (1) $\overline{AC} \cong \overline{BD}$ (3) $\overline{AC} \perp \overline{BD}$
(2) $\overline{AB} \perp \overline{BD}$ (4) \overline{AC} bisects $\angle BCD$

5 The endpoints of directed line segment PQ have coordinates of $P(-7,-5)$ and $Q(5,3)$. What are the coordinates of point A , on \overline{PQ} , that divide \overline{PQ} into a ratio of 1:3?

- (1) $A(-1,-1)$ (3) $A(3,2)$
(2) $A(2,1)$ (4) $A(-4,-3)$

6 In trapezoid $ABCD$ below, $\overline{AB} \parallel \overline{CD}$.

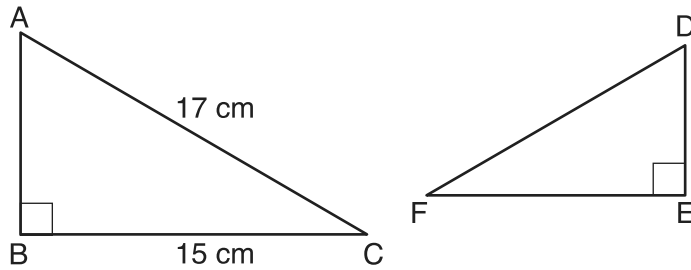


If $AE = 5.2$, $AC = 11.7$, and $CD = 10.5$, what is the length of \overline{AB} , to the nearest tenth?

- (1) 4.7 (3) 8.4
(2) 6.5 (4) 13.1

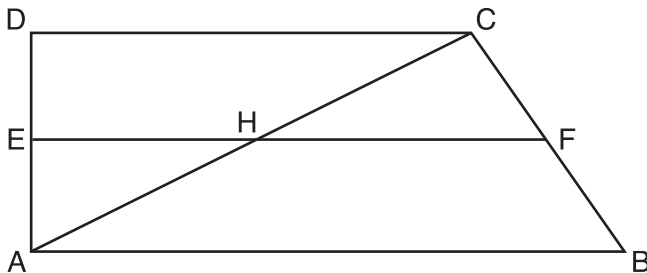
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- 7 Kayla was cutting right triangles from wood to use for an art project. Two of the right triangles she cut are shown below.



If $\triangle ABC \sim \triangle DEF$, with right angles B and E , $BC = 15$ cm, and $AC = 17$ cm, what is the measure of $\angle F$, to the nearest degree?

- (1) 28° (2) 41° (3) 62° (4) 88°
- 8 The line represented by $2y = x + 8$ is dilated by a scale factor of k centered at the origin, such that the image of the line has an equation of $y - \frac{1}{2}x = 2$. What is the scale factor?
- (1) $k = \frac{1}{2}$ (2) $k = 2$ (3) $k = \frac{1}{4}$ (4) $k = 4$
- 9 In quadrilateral $ABCD$ below, $\overline{AB} \parallel \overline{CD}$, and E , H , and F are the midpoints of \overline{AD} , \overline{AC} , and \overline{BC} , respectively.



If $AB = 24$, $CD = 18$, and $AH = 10$, then FH is

- (1) 9 (2) 10 (3) 12 (4) 21

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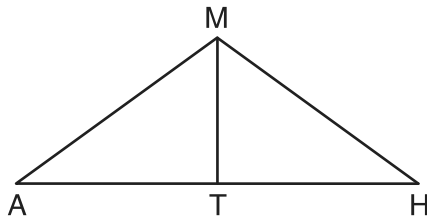
10 Jaden is comparing two cones. The radius of the base of cone A is twice as large as the radius of the base of cone B . The height of cone B is twice the height of cone A . The volume of cone A is

- (1) twice the volume of cone B
- (2) four times the volume of cone B
- (3) equal to the volume of cone B
- (4) equal to half the volume of cone B

11 A regular hexagon is rotated about its center. Which degree measure will carry the regular hexagon onto itself?

- (1) 45°
- (2) 90°
- (3) 120°
- (4) 135°

12 In triangle MAH below, \overline{MT} is the perpendicular bisector of \overline{AH} .



Which statement is *not* always true?

- (1) $\triangle MAH$ is isosceles.
- (2) $\triangle MAT$ is isosceles.
- (3) \overline{MT} bisects $\angle AMH$.
- (4) $\angle A$ and $\angle TMH$ are complementary.